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1 [A software engineering perspective on algorithmics](#)



Karsten Weihe

 March 2001 **ACM Computing Surveys (CSUR)**, Volume 33 Issue 1

Publisher: ACM Press

 Full text available: [pdf\(1.62 MB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#), [review](#)

An algorithm component is an implementation of an algorithm which is not intended to be a stand-alone module, but to perform a specific task within a large software package or even within several distinct software packages. Therefore, the design of algorithm components must also incorporate software-engineering aspects. A key design goal is adaptability. This goal is important for maintenance throughout a project, prototypical development, and reuse in new, unforeseen context ...

Keywords: algorithm engineering

2 [Frontmatter \(TOC, Letters, Philosophy of computer science, Interviewers needed,](#)



[Taking software requirements creation from folklore to analysis, SW components and product lines: from business to systems and technology, Software engineering survey\)](#)

 September 2005 **ACM SIGSOFT Software Engineering Notes**, Volume 30 Issue 5

Publisher: ACM Press

 Full text available: [pdf\(1.98 MB\)](#)

 Additional Information: [full citation](#)

3 [Modularisation and composition of aspectual requirements](#)



Awais Rashid, Ana Moreira, João Araújo

 March 2003 **Proceedings of the 2nd international conference on Aspect-oriented software development**

Publisher: ACM Press

 Full text available: [pdf\(1.06 MB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

An effective requirements engineering (RE) approach must harmonise the need to achieve separation of concerns with the need to satisfy broadly scoped requirements and constraints. Techniques such as use cases and viewpoints help achieve separation of stakeholders' concerns but ensuring their consistency with global requirements and constraints is largely unsupported. In this paper we propose an approach to modularise and compose such crosscutting, aspectual requirements. The approach is based on ...

Keywords: aspect composition, aspect-oriented requirements engineering, aspectual trade-offs, traceability

4 Advances in Model-Based Testing (A-MOST 2005): Requirements traceability in automated test generation: application to smart card software validation

F. Bouquet, E. Jaffuel, B. Legeard, F. Peureux, M. Utting

May 2005 **ACM SIGSOFT Software Engineering Notes , Proceedings of the first international workshop on Advances in model-based testing A-MOST '05**, Volume 30 Issue 4

Publisher: ACM Press

Full text available:  pdf(685.74 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Automated test case and test driver generation from a formal model is becoming a more widely used practice in the smart card area. This innovative approach for validation testing makes it possible to ensure the functional coverage of the test suite and to automate the production of executable test scripts. This paper presents an approach to automatically produce the Traceability Matrix from requirements to test cases, as part of the test generation process. This approach is embedded in the LEIRI ...


Keywords: formal model, model-based testing, requirements traceability

5 Scheduling and mapping: software pipelining in the presence of structural hazards

Erik R. Altman, R. Govindarajan, Guang R. Gao

June 1995 **ACM SIGPLAN Notices , Proceedings of the ACM SIGPLAN 1995 conference on Programming language design and implementation PLDI '95**, Volume 30 Issue 6

Publisher: ACM Press

Full text available:  pdf(1.25 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


Recently, software pipelining methods based on an ILP (Integer Linear Programming) framework have been successfully applied to derive rate-optimal schedules for architectures involving clean pipelines - pipelines without structural hazards. The problem for architectures beyond such clean pipelines remains open. One challenge is how, under a unified ILP framework, to simultaneously represent resource constraints for unclean pipelines, and the assignment or mapping of operations from a loop t ...

6 Specifications a key to effective software development

P. C. Belford, A. F. Bond, D. G. Henderson, L. S. Sellers

October 1976 **Proceedings of the 2nd international conference on Software engineering**

Publisher: IEEE Computer Society Press

Full text available:  pdf(981.32 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Specifications provide the fundamental link to make the transition between the concept and definition phases of the system development cycle. Straightforward, unambiguous specifications are required to ensure successful results and at the same time minimize cost overruns during the development cycle. Many of the problems currently being addressed by software engineers have their origins in the frequently inconsistent and incomplete nature of system specifications. The U.S. Army B ...

Keywords: Decomposition, Requirements verification, Software engineering, Specification verification, Verification

7 An assessment model for requirements identification in component-based software development

Hemant Jain, Padmal Vitharana, Fatemah Mariam Zahedi

November 2003 **ACM SIGMIS Database**, Volume 34 Issue 4

Publisher: ACM Press

Full text available:  [pdf\(320.60 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Software development literature is replete with studies that demonstrate how ineffective requirements analysis (RA) has led to failed applications. Some of the difficulties encountered in RA however are due to inherent limitations in traditional approach to software development. On the other hand, component-based software development (CBSD) presents a unique approach to developing software. Components advertise the services they offer and could be organized in a knowledge-base (i.e., repository) ...

Keywords: component-based software development, information processing theory, requirements analysis

8 An empirical study of industrial requirements engineering process assessment and improvement

 Ian Sommerville, Jane Ransom

January 2005 **ACM Transactions on Software Engineering and Methodology (TOSEM)**, Volume 14 Issue 1


Publisher: ACM Press

Full text available:  [pdf\(1.51 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This article describes an empirical study in industry of requirements engineering process maturity assessment and improvement. Our aims were to evaluate a requirements engineering process maturity model and to assess if improvements in requirements engineering process maturity lead to business improvements. We first briefly describe the process maturity model that we used and modifications to this model to accommodate process improvement. We present initial maturity assessment results for nine c ...

Keywords: Software process improvement, empirical software engineering, process measurement, requirements engineering

9 GPGPU: general purpose computation on graphics hardware

 David Luebke, Mark Harris, Jens Krüger, Tim Purcell, Naga Govindaraju, Ian Buck, Cliff Woolley, Aaron Lefohn


August 2004 **Proceedings of the conference on SIGGRAPH 2004 course notes GRAPH '04**

Publisher: ACM Press

Full text available:  [pdf\(63.03 MB\)](#) Additional Information: [full citation](#), [abstract](#)


The graphics processor (GPU) on today's commodity video cards has evolved into an extremely powerful and flexible processor. The latest graphics architectures provide tremendous memory bandwidth and computational horsepower, with fully programmable vertex and pixel processing units that support vector operations up to full IEEE floating point precision. High level languages have emerged for graphics hardware, making this computational power accessible. Architecturally, GPUs are highly parallel s ...

10 Software reuse

 Charles W. Krueger

June 1992 **ACM Computing Surveys (CSUR)**, Volume 24 Issue 2


Publisher: ACM Press

Full text available:  [pdf\(4.96 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Software reuse is the process of creating software systems from existing software rather than building software systems from scratch. This simple yet powerful vision was introduced in 1968. Software reuse has, however, failed to become a standard software engineering practice. In an attempt to understand why, researchers have renewed their interest in software reuse and in the obstacles to implementing it. This paper surveys the

different approaches to software reuse found in the ...


Keywords: abstraction, cognitive distance, software reuse

- 11 [Frontmatter \(TOC, Letters, Election results, Software Reliability Resources!, Computing Curricula 2004 and the Software Engineering Volume SE2004, Software Reuse Research, ICSE 2005 Forward\)](#) 

July 2005 **ACM SIGSOFT Software Engineering Notes**, Volume 30 Issue 4

Publisher: ACM Press

Full text available:  [pdf\(6.19 MB\)](#) Additional Information: [full citation](#), [index terms](#)



- 12 [Workshop and conference summaries: Report of the International Symposium on Component-Based Software Engineering](#) 

Ivica Crnkovic, Ralf Reussner, Heinz Schmidt, Kevin Simons, Judith Stafford, Kurt Wallnau
May 2005 **ACM SIGSOFT Software Engineering Notes**, Volume 30 Issue 3

Publisher: ACM Press

Full text available:  [pdf\(312.87 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The International Symposium on Component-Based Software Engineering (CBSE7) was held at 28th International Conference on Software Engineering in Edinburgh, Scotland, May 24-25, 2004. The Symposium brought together researchers and practitioners from several communities: component technology, composition languages, compositional analysis, software architecture, software certification and scientific computing. The primary goal of the symposium was to continue clarifying the concepts, ide ...


- 13 [QFD application in software process management and improvement based on CMM](#) 
-  Xiaoqing (Frank) Liu, Yan Sun, Gautam Kane, Yuji Kyoya, Kunio Noguchi
May 2005 **ACM SIGSOFT Software Engineering Notes , Proceedings of the third workshop on Software quality 3-WoSQ**, Volume 30 Issue 4

Publisher: ACM Press

Full text available:  [pdf\(174.92 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Capability Maturity Model (CMM) from Software Engineering Institute has been used successfully by many organizations for software process improvement. However, there exists a disconnection between business goals and maturity levels. A new framework using Quality Function Deployment (QFD) is developed to deal with this problem. This framework serves three purposes: (1) it provides a connection between business requirements and CMM; (2) it proposed a methodology for the priority assessment of requ ...


- 14 [The elements of nature: interactive and realistic techniques](#) 



 Oliver Deussen, David S. Ebert, Ron Fedkiw, F. Kenton Musgrave, Przemyslaw Prusinkiewicz, Doug Roble, Jos Stam, Jerry Tessendorf
August 2004 **Proceedings of the conference on SIGGRAPH 2004 course notes GRAPH '04**




Publisher: ACM Press




Full text available:  [pdf\(17.65 MB\)](#) Additional Information: [full citation](#), [abstract](#)

This updated course on simulating natural phenomena will cover the latest research and production techniques for simulating most of the elements of nature. The presenters will provide movie production, interactive simulation, and research perspectives on the difficult task of photorealistic modeling, rendering, and animation of natural phenomena. The course offers a nice balance of the latest interactive graphics hardware-based simulation techniques and the latest physics-based simulation techni ...

- 15 [IS '97: model curriculum and guidelines for undergraduate degree programs in information systems](#) 




-  Gordon B. Davis, John T. Gorgone, J. Daniel Couger, David L. Feinstein, Herbert E. Longenecker
December 1996 **ACM SIGMIS Database , Guidelines for undergraduate degree programs on Model curriculum and guidelines for undergraduate degree programs in information systems IS '97**, Volume 28 Issue 1
Publisher: ACM Press
Full text available:  [pdf\(7.24 MB\)](#) Additional Information: [full citation](#), [citations](#)

- 16 [Status report of the graphic standards planning committee of ACM/SIGGRAPH: State-of-the-art of graphic software packages](#) 
 Computer Graphics staff
September 1977 **ACM SIGGRAPH Computer Graphics**, Volume 11 Issue 3
Publisher: ACM Press
Full text available:  [pdf\(9.03 MB\)](#) Additional Information: [full citation](#), [references](#)

- 17 [Requirements engineering: Quantitative WinWin: a new method for decision support in requirements negotiation](#) 
 Günther Ruhe, Armin Eberlein, Dietmar Pfahl
July 2002 **Proceedings of the 14th international conference on Software engineering and knowledge engineering SEKE '02**
Publisher: ACM Press
Full text available:  [pdf\(196.56 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)



Defining, prioritizing, and selecting requirements are problems of tremendous importance. In this paper, a new approach called Quantitative WinWin for decision support in requirements negotiation is studied. The difference to Boehm's WinWin groupware-based negotiation support is the inclusion of quantitative methods as a backbone for better and more objective decisions. Like Boehm's original WinWin, Quantitative WinWin uses an iterative approach, with the aim to increase knowledge about the requ ...


Keywords: analytical hierarchy process, decision support, easy winwin, effort estimation, quantitative methods, requirements negotiation, simulation

- 18 [Software engineering: applications, practices and tools \(SE\): A strategy for selecting multiple components](#) 
 Ed Mancebo, Anneliese Andrews
March 2005 **Proceedings of the 2005 ACM symposium on Applied computing SAC '05**
Publisher: ACM Press
Full text available:  [pdf\(138.64 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper presents a systematic method for simultaneously defining a software architecture and selecting off-the-shelf components for reuse. The method builds upon existing techniques for component selection and architecture evaluation. We identify architectural decisions that have a large effect on the components used early in the process so that different ways of building the system can be investigated. The result of applying the method is a partial definition of a system's architecture along ...

Keywords: component selection, component-based software engineering, multi-criteria decision making, software architecture

- 19 [Measuring reuse of SAP requirements: a model-based approach](#) 
 Maya Daneva
May 1999 **Proceedings of the 1999 symposium on Software reusability**
Publisher: ACM Press

Full text available:  pdf(1.14 MB)Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: component-based engineering, quantification and metrics for reuse, reuse of software engineering work products

20 [Visualizing geospatial data](#)



Theresa Marie Rhyne, Alan MacEachern, Theresa-Marie Rhyne

August 2004 **Proceedings of the conference on SIGGRAPH 2004 course notes GRAPH '04****Publisher:** ACM PressFull text available:  pdf(13.99 MB)Additional Information: [full citation](#), [abstract](#)

This course reviews concepts and highlights new directions in GeoVisualization. We review four levels of integrating geospatial data and geographic information systems (GIS) with scientific and information visualization (VIS) methods. These include:

- Rudimentary: minimal data sharing between the GIS and Vis systems
- Operational: consistency of geospatial data
- Functional: transparent communication between the GIS and Vis systems
- Merged: one comprehensive toolkit environment

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Design of software systems based on axiomatic design. SJ Kim, NP Suh, SG

Kim ROBOT. COMP. INTEGRATED MANUF. 8:44, 243-255, 1991. ...

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G Berry, G Gonthier - Science of Computer Programming, 1992 - [portal.acm.org](#)

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[book] Synchronous Programming of Reactive Systems

N Halbwachs - 1992 - Kluwer Academic Publishers Norwell, MA, USA

... for production-based specification, Readings in hardware/software co-design, Kluwer

Academic ... architecture, and synthesis for embedded **systems**, October 08-11 ...

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Decision making and software tools for product development based on axiomatic design theory

V Harutunian, M Nordlund, D Tate, NP Suh - [axiomaticdesign.com](#)

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[book] Axiomatic design: advances and applications

NP Suh - 2001 - [books.google.com](#)

... Because most engineering tasks deal with **systems**, Chapter 4 should be ... Chapter 5, which focuses on **software design**, demonstrates how easily **software** can be ...

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On the Development of Reactive Systems - group of 3 »

D Harel, A Pnueli - NATO ASI Series - [portal.acm.org](#)

... Albert Benveniste, Gérard Berry, The synchronous approach to reactive and real-time **systems**, Readings in hardware/software co-design, Kluwer Academic ...

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Application of design axioms for glass-bulb design and software development for design automation - group of 2 »

SH Do, GJ Park - Journal of Mechanical **Design**, 2001 - [link.aip.org](#)

Kim, SJ, Suh, NP, and Kim, SG, 1991, "Design of Software Systems Based on Axiomatic

Design," Rob. Comput.-Integr. Manufact., 8, No. 4, pp. 243-255. ...

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Toward principles for the design of ontologies used for knowledge sharing - group of 33 »

TR Gruber - [ra.crema.unimi.it](#)

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[book] The principles of design

NP Suh - 1990 - [books.google.com](#)

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JB Goodenough - Communications of the ACM, 1975 - [portal.acm.org](#)

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Terms used **functional requirement matrix**

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- 1 [Proposed standard for packages of real and complex type declarations and basic operations for Ada \(including vector and matrix types\)](#)


September 1991 **ACM SIGAda Ada Letters**, Volume XI Issue 7

Publisher: ACM Press

Full text available: pdf(1.95 MB)

Additional Information: [full citation](#), [index terms](#)

- 2 [An innovative approach to system requirements analysis by using structural modeling method](#)



Norihiisa Komoda, Koichi Haruna, Hiroyuki Kaji, Hiroshi Shinozawa

March 1981 **Proceedings of the 5th international conference on Software engineering**

Publisher: IEEE Press

Full text available: pdf(658.46 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

As an innovative approach to the system requirements analysis, this paper proposes a computer aided method to develop objectives trees. This method consists of a procedure, algorithms and, a man-machine interactive graphic system. And two typical kinds of applications of the objectives tree in computer applications system planning are described. By this method, working man-hours to develop an objectives tree can be decreased, and quality of communication among system vendors, end-users of a ...

- 3 [Early traceability concepts: Toward improved traceability of non-functional requirements](#)



Jane Cleland-Huang

November 2005 **Proceedings of the 3rd international workshop on Traceability in emerging forms of software engineering TEFSE '05**

Publisher: ACM Press

Full text available: pdf(348.25 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This position paper examines current practices and challenges for tracing non-functional requirements (NFRs). Anecdotal evidence suggests that many organizations do not effectively trace NFRs and that functional changes are often implemented with very little understanding as to how system qualities such as safety, security, and performance will be impacted. The tendency for NFRs to have broad ranging impact upon a software system, and the strong interdependencies and tradeoffs that exist between ...

Keywords: non-functional requirements, software architecture, traceability